

BIOGRAPHICAL SKETCH

NAME Harry Meade, Ph.D.		POSITION TITLE Senior Vice President of R&D, GTC Biotherapeutics		
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>				
INSTITUTION AND LOCATION		DEGREE	YEAR(s)	FIELD OF STUDY
Union College		B.S.	1969	Chemistry & Electrical Engineering
Massachusetts Institute of Technology, Cambridge, MA		Ph.D.	1977	Biology

A. Positions and Honors**Positions and employment**

- 1977 – 1979 Post doctoral studies in the Cellular and Development Biology Department at Harvard University, Cambridge, MA
- 1979 - 1981 Sr. Scientist in Development Department, Merck & Co, Rahway, NJ
- 1981 – 1990 Scientist and later senior scientist at Biogen, Inc., with a focus on expression systems, first in Streptomyces and then in the mammary gland.
- 1990 – present Various positions at Genzyme, starting as a molecular biologist in the transgenics group. Appointed research director in 1993 when GTC became an independent company, Vice President of Transgenic Research in 1994 and Senior VP in 2002.

B. Publications (out of 41 peer-reviewed papers)

1. Miroff G, Meade HM, Winetroun M, and Lamberson HV. Unique glycoprotein from mouse milk containing the mammary tumour agent. Nature, 227: 1243-4, 1970.
2. Baglioni C, Jacobs-Lorena M and Meade H. The site of action of inhibitors of initiation of protein synthesis in reticulocytes. Biochim Biophys Acta, 277: 188-97, 1972.
3. Meade HM and Signer ER. Genetic mapping of Rhizobium meliloti. Proc Natl Acad Sci U S A, 74: 2076-8, 1977.
4. Meade HM, Long SR, Ruvkun GB, Brown SE, and Ausubel FM. Physical and genetic characterization of symbiotic and auxotrophic mutants of Rhizobium meliloti induced by transposon Tn5 mutagenesis. J Bacteriol, 149: 114-22, 1982.
5. Meade H, Gates L, Lacy E, and Lonberg N. Bovine alpha S1-casein gene sequences direct high level expression of active human urokinase in mouse milk. Biotechnology (N Y), 8: 443-6, 1990.
6. DiTullio P, Cheng SH, Marshall J, Gregory RJ, Ebert KM, Meade HM, and Smith AE. Production of cystic fibrosis transmembrane conductance regulator in the milk of transgenic mice. Biotechnology (N Y), 10: 74-7, 1992
7. Rybak SM, Hoogenboom HR, Meade HM, Raus JC, Schwartz D, and Youle RJ. Humanization of immunotoxins. Proc Natl Acad Sci U S A, 89: 3165-9, 1992.
8. Ebert KM, DiTullio P, Barry CA, Schindler JE, Ayres SL, Smith TE, Pellerin LJ, Meade HM, Denman J, and Roberts B. Induction of human tissue plasminogen activator in the mammary gland of transgenic goats. Biotechnology (N Y), 12: 699-702, 1994.
9. Gutierrez A, Meade HM, DiTullio P, Pollock D, Harvey M, Jimenez-Flores R, Anderson GB, Murray JD, and Medrano JF. Expression of a bovine kappa-CN cDNA in the mammary gland of transgenic mice utilizing a genomic milk protein gene as an expression cassette. Transgenic Res, 5: 271-9, 1996.

10. Gutierrez-Adan A, Maga EA, Meade H, Shoemaker CF, Medrano JF, Anderson GB, and Murray JD. Alterations of the physical characteristics of milk from transgenic mice producing bovine kappa-casein. *J Dairy Sci*, 79: 791-9, 1996.
 11. Meade HM. Dairy gene. *Sciences (New York)*, 37: 20-5, 1997.
 12. Gavin WG, Pollock D, Fell P, Yelton D, Cammuso C, Harrington M, Lewis-Williams J, Midura P, Oliver A, Smith TE, Wilburn B, Echelard Y and Meade H. Expression of the Antibody hBR96-2 in the Milk of Transgenic Mice and Production of hBR96-2 Transgenic Goats. *Theriogenology* Vol 47, Number 1 214-219 (1997)
 13. Edmunds T, Van Patten SM, Pollock J, Hanson E, Bernasconi R, Higgins E, Manavalan P, Ziomek C, Meade H, McPherson JM, and Cole ES. Transgenically produced human antithrombin: structural and functional comparison to human plasma-derived antithrombin. *Blood*, 91: 4561-71, 1998.
 14. Young MW, Meade H, Curling JM, Ziomek CA, Harvey M. Production of recombinant antibodies in the milk of transgenic animals. *Res Immunol*. 1998 Jul-Aug;149(6):609-10.
 15. Meade HM and Ziomek C. Urine as a substitute for milk? *Nat Biotechnol*, 16: 21-2, 1998
 16. Young MW, Meade HM, Curling JM, Ziomek CA, and Harvey M. Production of recombinant antibodies in the milk of transgenic animals. *Res Immunol*, 149: 609-10, 1998.
 17. Baguisi A, Behboodi E, Melican DT, Pollock JS, Destrempes MM, Cammuso C, Williams JL, Nims SD, Porter CA, Midura P, Palacios MJ, Ayres SL, Denniston RS, Hayes ML, Ziomek CA, Meade HM, Godke RA, Gavin WG, Overstrom EW, and Echelard Y. Production of goats by somatic cell nuclear transfer. *Nat Biotechnol*, 17: 456-61, 1999.
 18. Newton DL, Pollock D, DiTullio P, Echelard Y, Harvey M, Wilburn B, Williams J, Hoogenboom HR, Raus JC, Meade HM, and Rybak SM. Antitransferrin receptor antibody-RNase fusion protein expressed in the mammary gland of transgenic mice. *J Immunol Methods*, 231: 159-67., 1999.
 19. Pollock DP, Kutzko JP, Birck-Wilson E, Williams JL, Echelard Y, and Meade HM. Transgenic milk as a method for the production of recombinant antibodies. *J Immunol Methods*, 231: 147-57, 1999.
 20. Behboodi E, Groen W, Destrempes MM, Williams JL, Ohlrichs C, Gavin WG, Broek DM, Ziomek CA, Faber DC, Meade HM, and Echelard Y. Transgenic production from in vivo-derived embryos: effect on calf birth weight and sex ratio. *Mol Reprod Dev*, 60: 27-37, 2001.
 21. Echelard Y and Meade HM. Toward a new cash cow. *Nat Biotechnol*, 20: 881-2, 2002.
 22. Stowers AW, Chen LH, Zhang Y, Kennedy MC, Zou L, Lambert L, Rice TJ, Kaslow DC, Saul A, Long CA, Meade HM, and Miller LH. A recombinant vaccine expressed in the milk of transgenic mice protects Aotus monkeys from a lethal challenge with Plasmodium falciparum. *Proc Natl Acad Sci U S A*, 99: 339-44, 2002.
 23. Echelard Y, Meade HM. Protein Production in the milk of transgenic animals. In "Gene Transfer and Expression in Mammalian Cells", edited by S. C. Makrides, New Comprehensive Biochemistry Vol. 38, General Editor: G. Bernardi. Elsevier BV. 2003
- Behboodi E, Memili E, Melican DT, Destrempes MM, Overton SA, Williams JL, Flanagan PA, Butler RE, Liem H, Chen LH, Meade HM, Gavin WG, Echelard Y. Viable transgenic goats derived from skin cells. *Transgenic Res* 13:215-224, 2004.

C. Issued Patents

1. 4,873,316 (1989) Isolation of exogenous recombinant proteins from the milk of transgenic mammals
2. 5,168,049 (1992) Production of streptavidin-like polypeptides
3. 5,272,254 (1993) Production of streptavidin-like polypeptides
4. 5,688,677 (1997) Deoxyribonucleic acids containing inactivated hormone responsive elements
5. 5,750,172 (1998) Transgenic non human mammal milk
6. 5,827,690 (1998) Transgenic production of antibodies in milk
7. 5,843,705 (1998) Transgenically produced antithrombin III
8. 5,849,992 (1998) Transgenic production of antibodies in milk
9. 6,441,145 (2002) Transgenically produced Antithrombin III
10. 6,528,699 (2003) Transgenically produced non-secreted proteins
11. 6,548,653 (2003) Erythropoietin analog-human serum albumin fusion.
12. 6,593,463 (2003) Modified MSP-1 nucleic acid sequences and methods for increasing mRNA levels

D. Ongoing Research Support

National Institute of Health, National Heart, Lung and Blood Institute.

Phase I/II Small Business Innovation Research Program. July 2004–

December 2006. Title: Improved yield of human albumin from transgenic cow milk. Grant No. 1 R44 HL078300-01. Role on project: Principal Investigator.

The overall goal of this program is to provide an abundant, cost-effective, biosecure source of human albumin for human therapeutic use by producing recombinant human albumin (rhA) in the milk of transgenic cows